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Application No.: 10/707,867
Docket No.: 11870-US-PA

REMARKS

Present Status of the Application

The Office Action rejected all presently-pending claims 1-20. Specifically, the Office Action rejected claims 1-4 and 7-9 under 35 U.S.C. 102(b), as being anticipated by Kusumoto et al. (U.S. Patent No. 6,025,794). The Office Action also rejected claims 10, 11 and 16-19 under 35 U.S.C. 102(b) as being anticipated by Zhou et al. (U.S. Patent No. 6,124,819). The Office Action rejected claims 5, 6 under 35 U.S.C. 103(a), as being unpatentable over Kusumoto et al. as applied to claim as applied to claim 4 above, and further in view of Zhou et al., as applied to claim 10 above. The Office Action also rejected claims 12-15 and 20 under 35 U.S.C. 103(a), as being unpatentable over Zhou et al. as applied to claim as applied to claim 11 above, and further in view of Kusumoto et al. as applied to claim 3 above. The original claims 1-20 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Office Action Rejections

Rejections under 35 U.S.C. 102(b) by Kusumoto

The Office Action rejected claims 1-4 and 7-9 under 35 U.S.C. 102(b), as being anticipated by Kusumoto et al. (U.S. Patent No. 6,025,794, "Kusumoto" hereinafter). Applicant does not agree and respectfully traverse the rejections for at least the reasons set forth below.

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For a proper rejection of a claim under 35 U.S.C. Section 102, the cited reference must disclose all elements/features/steps of the claim. See, *e.g.*, *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 7 USPQ2d 1129 (Fed. Cir. 1988).

Independent claim 1 recites the features of the present invention in the following:

1. An automatic threshold voltage control circuit, comprising:
 - a first capacitor, having a first terminal and a second terminal, wherein said first terminal is coupled to a first voltage level;
 - a clock generator, for generating a plurality of clock signals; and
 - a switching capacitor network, coupled to said second terminal of said first capacitor, wherein the switching capacitor network receives an analog signal and said clock signals, stores a portion of charges of said analog signal, and outputs said portion of charges according to said clock signals, and generates a threshold voltage associated with said first capacitor.

Independent claim 1 is allowable for at least the reason that Kusumoto does not disclose, teach, or suggest all of the features as defined in claim 1 above. More particularly, the reference by Kusumoto does not disclose, teach, or suggest "a switching capacitor network, coupled to said second terminal of said first capacitor, wherein the switching capacitor network receives an analog signal and said clock signals, stores a portion of charges of said analog signal, and outputs said portion of charges according to said clock signals, and generates a threshold voltage associated with said first capacitor" as defined in claim 1.

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First, the switching capacitor network disclosed by Kusumoto includes only switches 248 and 249, and does not include any other capacitor. Therefore, the switching capacitor network by Kusumoto cannot store and output charges as the switching capacitor network defined in claim 1. Second, the switching capacitor network in claim 1 generates a threshold voltage associated with the first capacitor. In contrast, the charge transfer in the reference by Kusumoto (col. 18 lines 42-52) is simply for signal amplification and does not generate a threshold voltage. In fact, Kusumoto neither teaches nor suggests "threshold voltage" generated by the switching capacitor network as defined in claim 1.

Thus, Kusumoto does not anticipate claim 1, and the rejection should be withdrawn.

If independent claim 1 is allowable over the prior art of record, then its dependent claims 2-4 and 7-9 are allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claim 1. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing reasons for the allowability of claim 1, these dependent claims recite further features and/or combinations of features (as is apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are other reasons why these dependent claims are allowable and some of these reasons are set forth hereafter, as examples.

For example, in dependent claim 2, a plurality of sensor control switches are disclosed, which are series-connected for a series structure having a first terminal and a second terminal. It is asserted in the Office Action that the switches 248 and 249 in Fig. 24 of the reference by Kusumoto anticipate the series structure of claim 2, and the two terminals of the switch 248 are

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equivalent to the first terminal and the second terminal in the reference by Kusumoto. However, the two terminals of the single switch 248 in the reference by Kusumoto are obviously different from the two terminals of a plurality of switches as defined in claim 2. The Kusumoto reference cited in the Office Action neither discloses or teaches all features in claim 2. Also, claim 2 includes the features of claim 1.

Therefore, the present invention is different from Kusumoto. Claims 3-4 are dependent on claim 2, and claims 7-9 are dependent on claim 1, and should be allowable for the same reasons stated above.

Rejections Under 35 U.S.C. 102(b) by Zhou

The Office Action also rejected claims 10, 11 and 16-19 under 35 U.S.C. 102(b) as being anticipated by Zhou et al. (U.S. Patent No. 6,124,819, "Zhou" hereinafter). Applicant does not agree and respectfully traverse the rejections for at least the reasons set forth below.

For a proper rejection of a claim under 35 U.S.C. Section 102(b), the cited reference must disclose all features of the claim.

Independent claim 10 recites the features of the present invention in the following:

10. An analog-to-digital signal converter circuit, comprising:

- a first capacitor, having a first terminal and a second terminal, wherein said first terminal is coupled to a first voltage level;
- a clock generator, for generating a plurality of clock signals;

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a switching capacitor network, coupled to said second terminal of said first capacitor, wherein the switching capacitor network receives an analog signal and said clock signals, said switching capacitor network stores a portion of charges of said analog signal, and outputs said portion of charges according to said clock signals, and generates a threshold voltage associated with said first capacitor; and

a comparator, for comparing said threshold voltage with said analog signal and outputting a digital signal.

Independent claim 10 is allowable for at least the reason that Zhou does not disclose, teach, or suggest all of the features as defined in claim 10 above. More particularly, Zhou does not disclose, teach, or suggest "a switching capacitor network, coupled to said second terminal of said first capacitor, wherein the switching capacitor network receives an analog signal and said clock signals, said switching capacitor network stores a portion of charges of said analog signal, and outputs said portion of charges according to said clock signals, and generates a threshold voltage associated with said first capacitor" as defined in claim 10.

First, the switching capacitor network in the reference by Zhou includes MOS transistors 75, 80, 84, 74, and does not include any capacitor. Therefore, the switching capacitor network in the reference by Zhou cannot store and output charges as the switching capacitor network defined in claim 10. Also, the switching capacitor network in claim 10 generates a threshold voltage associated with the first capacitor. In contrast, the reference by

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Zhou neither generates, teaches nor suggests any "threshold voltage" as taught in claim 10. Further, the comparator 310 in claim 10 compares the threshold voltage V_{REF} and the analog signal V_{IN} . If, as stated in the Office Action, this feature is anticipated in Fig. 6 in the reference by Zhou, then the comparator 62 in Fig. 6 of the reference by Zhou should receive at least one of V_s , V_R , and V_{ref} as input. However, Fig. 6 of the reference by Zhou does not teach or suggest as such. Therefore, the inputs of the comparator 310 in claim 10 are completely different from those of the comparator 62 disclosed by Zhou.

Thus, Zhou does not anticipate claim 10, and the rejection should be withdrawn.

If independent claim 10 is allowable over the prior art of record, then its dependent claims 11 and 16-19 are allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claim 10. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing reasons for the allowability of claim 10, these dependent claims recite further features and/or combinations of features (as is apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are other reasons why these dependent claims are allowable and some of these reasons are set forth hereafter, as examples.

For example, in dependent claim 11, a plurality of sensor control switches are disclosed, which are series-connected for a series structure having a first terminal and a second terminal. According to the Office Action, the switches 80 and 74 in Fig. 6 of the reference by Zhou anticipate the series structure of claim 11, and the two terminals of the switch 80 are the first terminal and the second terminal in the reference by Zhou. However, the two terminals of the

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single switch 80 in the reference by Zhou are obviously different from the two terminals of a plurality of switches in claim 11. That is, the reference cited in the Office Action does not include all features of claim 11. Second, claim 11 also includes the features of claim 10.

For at least the reasons stated above, claims 10, 11 are not anticipated by Zhou. Claims 16-18 are dependent on claim 10, and should be allowable for the same reasons.

In another example, independent claim 19 recites the features of the present invention in the following:

19. A method for converter an analog signal to a digital signal, comprising:
providing a first capacitor and a plurality of clock signals;
storing a portion of charges of an analog signal according to said clock signals;
generating a threshold voltage according to said clock signals based on said portion of charges associated with said first capacitor ; and
comparing said threshold voltage with said analog signal in order to output a digital signal.

Independent claim 19 is allowable for at least the reason that Zhou does not disclose, teach, or suggest the features in claim 19 above. More specifically, in claim 19, a threshold voltage associated with the first capacitor is generated. In contrast, the reference by Zhou neither generates, teaches nor suggests any "threshold voltage." Second, claim 19 compares the threshold voltage and an analog signal. If, as stated in the Office Action, this feature is

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anticipated in Fig. 6 in the reference by Zhou, then the comparator 62 in Fig. 6 in the reference by Zhou should receive as least one of V_s , V_R , and V_{ref} as input. However, Fig. 6 in the reference by Zhou does not teach or suggest as such. Consequently, Zhou does not anticipate claim 19, and the rejection should be withdrawn.

Rejections Under 35 U.S.C. 103(a) by Kusumoto in View of Zhou

The Office Action rejected claims 5, 6 under 35 U.S.C. 103(a), as being unpatentable over Kusumoto et al. as applied to claim as applied to claim 4 above, and further in view of Zhou et al., as applied to claim 10 above. Applicant does not agree and respectfully traverse the rejections for at least the reasons set forth below.

It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references must disclose, teach, or suggest, either implicitly or explicitly, all elements/features/steps of the claim at issue. See, *e.g.*, *In Re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981)

Dependent claim 5 is allowable for at least the reason that the combination of Kusumoto in view of Zhou does not disclose, teach, or suggest the features in claim 5 above. Moreover claim 5 also includes the scopes of claims 1-4. Claim 2 discloses a plurality of sensor control switches, which are series-connected for a series structure having a first terminal and a second terminal. According to the Office Action, it is asserted that the switches 248 and 249 in Fig. 24 of the reference by Kusumoto anticipate the series structure of claim 2, and the two

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terminals of the switch 248 are the first terminal and the second terminal in the reference by Kusumoto. However, the two terminals of the single switch 248 in the reference by Kusumoto are obviously different from the two terminals of a plurality of switches in claim 2. The reference cited in the Office Action does not disclose the full scope of claim 2. Furthermore, according to the reasons for claim 1 above, Fig. 24 and Fig. 25 in the reference by Kusumoto does not disclose the full scope of claim 1. Consequently, the combination of Kusumoto in view of Zhou does not render claim 5 obvious, and the rejection should be withdrawn.

Because claim 5 is allowable over the prior art of record, its dependent claim 6 is allowable as a matter of law, for at least the reason that the dependent claim contains all features/elements/steps of its independent claim 5. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing allowability of these dependent claims, the dependent claim recites further features and/or combinations of features (as is apparent by examination of the claim itself) that are patentably distinct from the prior art of record.

Rejections Under 35 U.S.C. 103(a) by Zhou in View of Kusumoto

The Office Action also rejected claims 12-15 and 20 under 35 U.S.C. 103(a), as being unpatentable over Zhou et al. as applied to claim as applied to claim 11 above, and further in view of Kusumoto et al. as applied to claim 3 above. Applicant does not agree and respectfully traverse the rejections for at least the reasons set forth below.

It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references

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must disclose, teach, or suggest, either implicitly or explicitly, all elements/features/steps of the claim at issue. See, *e.g.*, *In Re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981)

Dependent claim 12 is allowable for at least the reason that the combination of Zhou in view of Kusumoto does not disclose, teach, or suggest the features in claim 12 above. More specifically, the Office Action renders the dependent claim 12 obvious and unpatentable over Fig. 6 and Fig. 7 in the reference by Zhou, and further in view of Fig. 25 of the reference by Kusumoto. However, claim 12 also includes the scopes of claims 10 and 11. Claim 11 discloses a plurality of sensor control switches, which are series-connected for a series structure having a first terminal and a second terminal. According to the Office Action, it is asserted that the switches 80 and 74 in Fig. 6 of the reference by Zhou anticipate the series structure of claim 11, and the two terminals of the switch 80 are the first terminal and the second terminal in the reference by Zhou. However, the two terminals of the single switch 80 in the reference by Zhou are obviously different from the two terminals of a plurality of switches in claim 11. The reference cited in the Office Action does not disclose the full scope of claim 11. Furthermore, according to the reasons for claim 10 above, Fig. 6 and Fig. 7 in the reference by Zhou do not disclose the full scope of claim 10. Consequently, the combination of Zhou in view of Kusumoto does not render claim 12 obvious, and the rejection should be withdrawn.

Because claim 12 is allowable over the prior art of record, its dependent claims 13-15 are allowable as a matter of law, for at least the reason that these dependent claims contain all

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features/elements/steps of their respective independent claim 12. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing allowability of these dependent claims, the dependent claims recite further features and/or combinations of features (as is apparent by examination of the claim itself) that are patentably distinct from the prior art of record.

Finally, the Office Action also renders dependent claim 20 obvious and unpatentable over Fig. 6 and Fig. 7 in the reference by Zhou, and further in view of Fig. 25 in the reference by Kusumoto. Claim 20 includes the steps of conducting an analog signal to a second capacitor according to a first clock signal, and conducting a first capacitor and the second capacitor in response to a second clock signal. As stated in the Office Action, Fig. 6 in the reference by Zhou anticipates the two steps of claim 20, wherein the capacitor 50 is Zhou's first capacitor and the capacitor 52 is Zhou's second capacitor. However, Zhou does not teach or suggest the step of conducting the capacitors 50 and 52 in response to a clock signal. Therefore, the reference by Zhou does not include the full scope of claim 20. Furthermore, claim 20 also includes the scope of claim 19. According to the reasons stated above, Fig. 6 and Fig. 7 in the reference by Zhou do not disclose the full scope of claim 19. Consequently, the combination of Zhou in view of Kusumoto does not render claim 20 obvious, and the rejection should be withdrawn.

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For at least the foregoing reasons, Applicant respectfully submits that independent claims 1, 10, 19 patently define over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-9, 11-18 and 20 patently define over the prior art as well.

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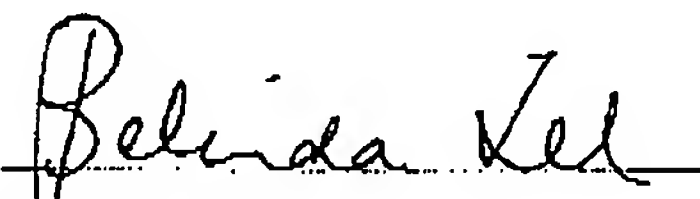
CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-20 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Date :

Dec. 15, 2004

Respectfully submitted,



Belinda Lee

Registration No.: 46,863

Jianq Chyun Intellectual Property Office
7th Floor-1, No. 100
Roosevelt Road, Section 2
Taipei, 100
Taiwan
Tel: 011-886-2-2369-2800
Fax: 011-886-2-2369-7233
Email: belinda@jciigroup.com.tw
Usa@jciigroup.com.tw

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